Space Weather Forecast

Issued on Saturday, 27 July 2024 at 01:12 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1/Minor Storms Days 1 and 2 (26-27 Jul). Chance of R1 Radio Blackouts throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a Moderate-class flare observed at 26/0442 UTC from a region near the southwest limb. There are currently twelve sunspot regions on the solar disc. A region just into the southwest quadrant remains the largest and most complex region. It continues to show plenty of spots, including some magnetic complexity. The region near the southwest limb has become increasingly difficult to view and analyse. A cluster of sunspot regions is also transiting across the southeast quadrant, which have been growing in size and complexity as they transit across the disc. A new region, still unnumbered, has recently emerged over the northeast limb. All other remaining regions appear small, simple and/or largely unchanged.

A potential eruption near centre disc does not appear to have produced a Coronal Mass Ejection (CME), therefore no new Earth directed CMEs have been seen in coronagraph imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds showed CME effects which appeared to transition to a coronal hole fast wind, although with an uncertain source. Wind speeds became elevated for much of the period, briefly peaking at 600 km/s, before declining to near 470 km/s. The Interplanetary magnetic field was initially strong, but is now weak. The north-south component was initially moderate variable, but became weakly variable during the period. Geomagnetic activity was Unsettled to Active (Kp 3-4), with a G1/Minor Storm (Kp5) interval observed 26/0300-0600 UTC.

Energetic Particles / Solar Radiation: Solar radiation is now at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected, with a chance of further Moderate-class flares.

Solar Wind /Geomagnetic Activity: A flare at 23/1430 UTC gave a CME, perhaps giving Earth a glancing blow early on Day 1 (27 Jul). In addition, an event just east of centre disc around 25/0100 UTC may have given a CME with a risk of some Earth directed influence, however it cannot be analysed due to far side CME contamination and the speed can only be guessed at. Confidence is low in both these features, giving significant uncertainty in the forecast through this period. Earth may also be under the influence of a fast wind from an unidentified coronal hole. Wind speeds are thought likely to gradually decline in the absence of CME influence over the next couple of days.

Geomagnetic activity is expected to be Quiet to Active with a chance of G1/Minor storm intervals on Day 1 if we see any CME influence, then a slight chance of G1 intervals through the following days with low confidence of a potential further CME arrival as discussed above.

Energetic Particles / Solar Radiation: Solar radiation is most likely to remain at background levels. However, there is a slight chance of rising above the S1/Minor Radiation Storm threshold in response to any notable flares from the west of the disc, most likely from the largest sunspot region.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	30	10	10	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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